

MENU

SEARCH

INDEX

DETAIL

JAPANESE

LEGAL
STATUS

1 / 1

PATENT ABSTRACTS OF JAPAN

(11)Publication number : **10-033448**

(43)Date of publication of
application : **10.02.1998**

(51)Int.Cl. **A47L 15/00**
B08B 3/02
B08B 3/08

(21)Application
number : **08-197678**

(71) **SANYO ELECTRIC CO LTD**
Applicant :

(22)Date of filing : **26.07.1996**

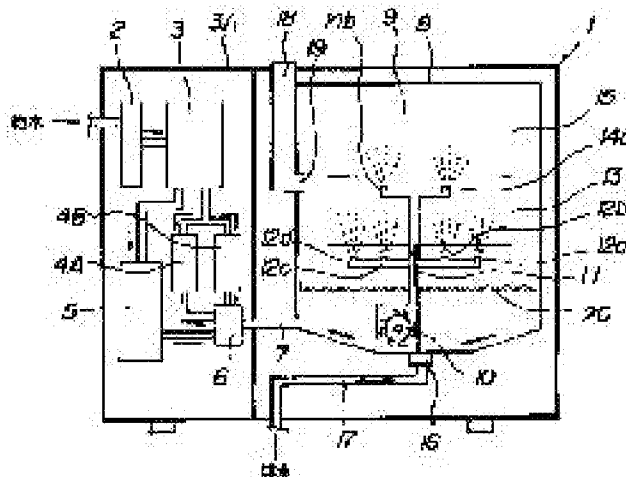
(72)Inventor : **HASEGAWA HIDETOSHI**

(54) DISHWASHER AND TWO STEP WASHING

(57)Abstract:

PROBLEM TO BE SOLVED: To efficiently wash tablewear using a small amount of a detergent by using a washing liquid comprising a strong alkaline water which is prepared by electrolyzing water containing table salt and heated at a high and low temperatures and added by an alkaline detergent thereto.

SOLUTION: The water from a water source is passed through a cation removing apparatus 2 and is added with table salt and electrolyzed to a strong alkaline water and strong acid water in an electrolyzing tank 3. The strong alkaline water in a tank 4A is heated and kept at a lower temperature and the strong alkaline water in tank 4B is heated and kept at a high temperature. Then the strong alkaline water kept at a low temperature is supplied to a washing case 8 and is added with an alkaline detergent from a detergent supply nozzle 19, the washing water is jetted from jetting nozzles 12a-12d, 14a, 14b using a water supply pump 10 to wash out soil adhered on the table wears. Then the strong alkali water kept at a high



temperature is supplied to a washing case 8, added with an alkaline detergent, jetted from jetting nozzle 12a-12d, 14a and 14b and circulated by the water supply pump to conduct the washing.

JAPANESE

[JP,10-033448,A]

Drawing selection

Representative draw

CLAIMS DETAILED DESCRIPTION TECHNICAL
FIELD PRIOR ART EFFECT OF THE INVENTION
TECHNICAL PROBLEM MEANS EXAMPLE
DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for
 any
 damages caused by the use of this
 translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

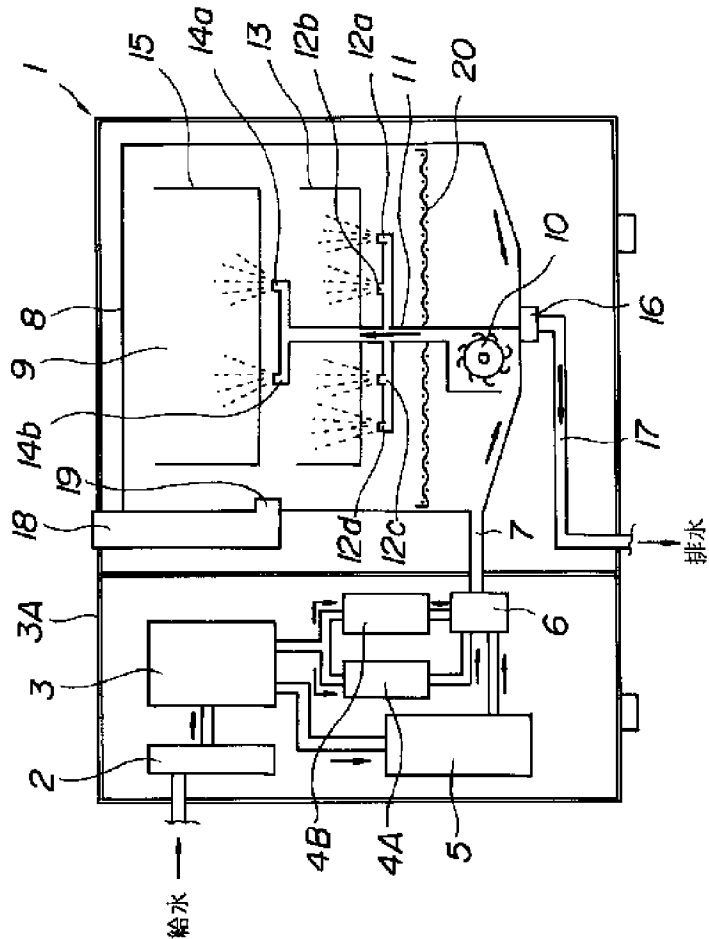
CLAIMS

[Claim(s)]

[Claim 1]It is a food-utensils scrubber which washes food utensils one by one using a penetrant remover which comprises strong alkali water controlled by temperature zone of an elevated temperature which added alkali detergent if needed, and low temperature, A food-utensils scrubber provided with a device which electrolyzes water supplied from the outside and manufactures said strong alkali water and strong acid water, a device which heats said strong alkali water, and is controlled and supplied to a temperature zone of an elevated temperature and low temperature, and a device which supplies said alkali detergent.

[Claim 2]The food-utensils scrubber according to claim 1 provided with a tank in which a tank in which low-temperature strong alkali water is stored, and hot strong alkali water are stored.

[Claim 3]Claim 1 neutralizing and draining wash water after washing food utensils with said strong acid water, or the



[Translation done.]

food-utensils scrubber according to claim 2.

[Claim 4]After washing food utensils using a penetrant remover which comprises strong alkali water controlled by 50-55 ** which added alkali detergent if needed, Claim 1 washing said food utensils using a penetrant remover which comprises strong alkali water controlled by 70-80 ** which added alkali detergent succeedingly thru/or the food-utensils scrubber according to claim 3.

[Claim 5]Claim 1 using alkali detergent containing an enzyme chosen from a proteolytic enzyme, an oil solution enzyme, and amylolytic enzyme thru/or the food-utensils scrubber according to claim 4.

[Claim 6]It is a food-utensils scrubber to claim 1 thru/or claim 5 washing food utensils using a hot penetrant remover which added 0.1 to 0.15% of the weight of alkali detergent succeedingly after washing food utensils using a penetrant remover of low temperature which added 0 to 0.1% of the weight of alkali detergent.

[Claim 7]After washing food utensils using a penetrant remover which comprises strong alkali water controlled by temperature zone of low temperature which added alkali detergent if needed using claim 1 thru/or the food-utensils scrubber according to claim 6, The two-step cleaning method of food utensils washing food utensils using a penetrant remover which comprises strong alkali water controlled by hot temperature zone which added alkali detergent succeedingly.

[Translation done.]

JAPANESE

[JP,10-033448,A]

Drawing selection

Representative draw

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS EXAMPLE DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

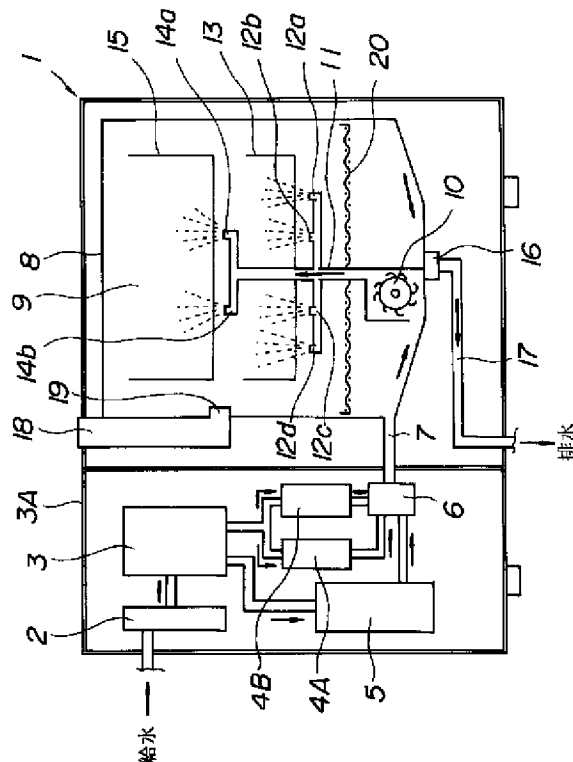
[0001]

[Field of the Invention]In a home, washing business, etc., in more detail this invention about a food-utensils scrubber and the two-step cleaning method of food utensils The plate of the size after a meal, It is related with the method of washing food utensils in two steps using the food-utensils scrubber which eats and can wash slag efficiently and this food-utensils scrubber of the meal containing ingredients adhering to a bowl, a teacup, SAJI, a spoon, chopsticks, etc., such as protein, an oil, and starch.

[0002]

[Description of the Prior Art]As it hits uniformly the surface and rear surface of the food utensils which became dirty about the wash water which provided the water spray port which waters wash water in a scrubber, circulated tap water as it is, and washed it conventionally, or added the detergent etc., he is trying to circulate through the inside of a scrubber. However, when using tap water etc. as it is, Since the dirt containing various kinds of ingredients does not come off even if it uses the wash water which there is fault of oil contamination accompanying the latest European-food-izing being unable to come off easily, and an offensive odor occurring plentifully within a tableware scrubber by the slag which was not washed, and added the detergent etc., while it became uneconomical that the necessity of making the amount of the detergent used increasing to about 0.2% of the weight or more as a result comes out etc., it became insufficient rinsing a detergent etc., and since there was much detergent concentration contained in wastewater, there were problems, like the adverse effect to environment comes out.

[0003]In order to solve these problems, the scrubber using both alkali ion water, and both [either or] which were obtained by electrolysis as wash water is proposed, but (JP,6-319673,A). When acid water is used as a penetrant remover, a protein diet article solidifies and become difficult to fall, on the other hand, when the alkaline water is used as a penetrant remover, there is a certain amount of cleaning effect, but. Since washing of a protein diet article, starch, etc. cannot be performed and also the reattachment of dirt could not be prevented, the food utensils to which the meal ate and slag adhered were not able to be washed efficiently. The strong alkali water and strong acid water which were obtained by electrolysis as wash water are used, Although heat strong alkali water at about 40 **, it is considered as wash water, it uses and the cleaning sterilization device which is strong acid water, and is rinsed and sterilized after washing is proposed (JP,6-296572,A), when strong alkali water is used as a penetrant remover, there is a cleaning



[Translation done.]

effect by a saponification operation of fats and oils or a proteinic solvent action, but. Since washing of starch cannot be performed and also the reattachment of dirt could not be prevented, the food utensils to which the meal containing ingredients, such as protein, an oil, and starch, ate, and slag adhered were not able to be washed efficiently.

[0004]

[Problem(s) to be Solved by the Invention]The purpose of this invention is to provide the scrubber and cleaning method which can wash efficiently food utensils containing ingredients, such as protein, an oil, and starch, such as the plate to which it ate and slag adhered, a bowl, a teacup, SAJI, a spoon, and chopsticks, by use of a little detergents.

[0005]

[Means for Solving the Problem]this invention person heats and controls strong alkali water produced by electrolyzing water which added salt as a result of repeating research that the above-mentioned technical problem should be solved to two sorts of temperature, an elevated temperature and low temperature, By washing food utensils which became dirty using a penetrant remover which added alkali detergent to strong alkaline water controlled by two sorts of these temperature if needed one by one, it finds out that the above-mentioned technical problem is solvable, and came to complete this invention.

[0006]An invention of claim 1 of this invention is a food-utensils scrubber which washes food utensils one by one using a penetrant remover which comprises strong alkali water controlled by temperature zone of an elevated temperature which added alkali detergent if needed, and low temperature, It is a food-utensils scrubber provided with a device which electrolyzes water supplied from the outside and manufactures said strong alkali water and strong acid water, a device which heats said strong alkali water, and is controlled and supplied to a temperature zone of an elevated temperature and low temperature, and a device which supplies said alkali detergent.

[0007]An invention of claim 2 of this invention was provided with a tank in which a tank in which low-temperature strong alkali water is stored, and hot strong alkali water are stored in the food-utensils scrubber according to claim 1.

[0008]An invention of claim 3 of this invention neutralizes and drains wash water after washing food utensils with said strong acid water in claim 1 or the food-utensils scrubber according to claim 2.

[0009]In claim 1 thru/or the food-utensils scrubber according to claim 3 an invention of claim 4 of this invention, After washing food utensils using a penetrant remover which comprises strong alkali water controlled by 50-55 ** which added alkali detergent if needed, said food utensils are washed using a penetrant remover which comprises strong alkali water controlled by 70-80 ** which added alkali detergent succeedingly.

[0010]An invention of claim 5 of this invention uses alkali detergent containing an enzyme chosen from a proteolytic enzyme, an oil solution enzyme, and amylolytic enzyme in claim 1 thru/or the food-utensils scrubber according to claim 4.

[0011]In claim 1 thru/or the food-utensils scrubber according to claim 5 an invention of claim 6 of this invention, After washing food utensils using a penetrant remover of low temperature which added 0 to 0.1% of the weight of alkali detergent, food utensils are washed using a hot penetrant remover which added 0.1 to 0.15% of the weight of alkali detergent succeedingly.

[0012]After an invention of claim 7 of this invention washes food utensils using a penetrant remover which comprises strong alkali water controlled by temperature zone of low temperature which added alkali detergent if needed using claim 1 thru/or the food-utensils scrubber according to claim 6, It is a two-step cleaning method of food utensils washing food utensils using a penetrant remover which comprises strong alkali water controlled by hot temperature zone which added alkali detergent succeedingly.

[0013]

[Embodiment of the Invention]The strong alkali water produced by electrolyzing by adding salt in water, such as tap water and well water, in this invention, and obtaining pH ten or more strong alkali water For example, the thing heated and controlled at 50-55 **, For example, a saponification operation of the oil according to strong alkaline water by making what was heated and controlled at 70-80 **, and washing food utensils one by one using the penetrant remover which comprises the strong alkali water controlled by the temperature zone of the elevated temperature which added alkali detergent if needed to two sorts of these strong alkali water, and low temperature, While a good cleaning effect is acquired by the cleaning effect over a proteinic solvent action and

starch, etc., When alkali detergent is used, a reattachment prevention operation of perviousness and dirt on the detergency which alkali detergent has, i.e., a surface activity operation, and dirt etc. are put together, and a cleaning effect rises dramatically according to these synergistic effects.

[0014]For this reason, it comes to be able to perform washing of the starch which was conventionally difficult to wash, a lip stick, etc., there is also no reattachment of dirt, and the food utensils to which the meal containing ingredients, such as protein, an oil, and starch, ate, and slag adhered can be washed efficiently. It may be necessary to use an alkali cleaner, and conventionally, although the alkali cleaner was usually used about 0.2% of the weight, according to the method of this invention, even though it uses it, about 0.05 % of the weight - about 0.15 % of the weight may be sufficient as it, and it can reduce the amount of the alkali cleaner used 25% - about 75%. There is an effect which was excellent in the ability to shorten washing time. The method which applies a penetrant remover in this invention is not limited, for example, can use both a soaking type, an injection nozzle type, etc.

[0015]Although pH in particular of the strong alkali water used by this invention is not limited, there is a possibility that ten or more may become it is desirable and insufficient [less than pH ten / a cleaning effect]. Especially if the temperature after heating of this strong alkali water is an elevated temperature and low temperature, they will not be limited. However, as low temperature, 50-55 ** is preferred. A cleaning effect becomes insufficient at less than 50 **, and when it exceeds 55 **, there is fear of proteinic coagulation, and also when adding a proteolytic enzyme, an oil solution enzyme, amylolytic enzyme, etc., an operation of these enzymes declines. As an elevated temperature, 70-80 ** is preferred. There is a possibility that the cleaning effect of a grain of cooked rice etc. may become insufficient at less than 70 **, and even if it exceeds 80 **, the improvement in the further cleaning effect is difficult, and becomes uneconomical.

[0016]In this invention, the use turn in particular of a low-temperature penetrant remover and a hot penetrant remover is not limited. However, when washing food utensils containing ingredients, such as protein, an oil, and starch, such as the plate to which it ate and slag adhered, a bowl, a teacup, SAJI, a spoon, and chopsticks, after a low-temperature penetrant remover washes, washing succeedingly with a hot penetrant remover is preferred. While dropping protein dirt and oil contamination by washing with a low-temperature penetrant remover, the pretreatment effect and immersion of as opposed to dirt, such as a grain of cooked rice and a lip stick, in washing with the penetrant remover of this low temperature -- by washing succeedingly with the penetrant remover of an elevated temperature effective, the problem of proteinic coagulation can be avoided and dirt, such as a grain of cooked rice and a lip stick, can fully be removed. And washing with this hot penetrant remover has a bactericidal effect. If it has the tank in which the strong alkali water heated and controlled by low temperature is stored in the food-utensils scrubber of this invention, and the tank in which the strong alkali water heated and controlled by the elevated temperature is stored, Since the strong alkali water and the hot strong alkali water of the saved low temperature can be used if needed and washing time can be shortened, it is desirable.

[0017]In this invention, since the ingredient disintegration (a proteolysis operation, an oil solution operation, an amyolysis operation, etc.) of various enzymes will be added if the enzyme chosen as alkali detergent from a proteolytic enzyme, an oil solution enzyme, amylolytic enzyme, etc. is added, a cleaning effect rises dramatically.

[0018]If the above strong alkali water is used in this invention, even if food utensils are fairly dirty, it becomes unnecessary to add 0.2% of the weight or more of alkali detergent, and 0.2 or less % of the weight of alkali detergent is only added if needed, Since food utensils containing ingredients, such as protein, an oil, and starch, such as the plate to which it ate and slag adhered, a bowl, a teacup, SAJI, a spoon, and chopsticks, can be washed efficiently, the detergent concentration contained in wastewater decreases and it becomes an environment-friendly cleaning method. However, in the case of the addition of 0.05 or less % of the weight of alkali detergent, the case where a cleaning effect is insufficient arises depending on dirt. In this invention, the adverse effect to natural environment can be reduced by neutralizing and draining wash water after washing food utensils using the strong acid water produced by electrolyzing.

[0019]Hereafter, this invention is explained with reference to drawings. Drawing 1 is an

outline lineblock diagram for explaining the food-utensils scrubber of this invention, and an example of a cleaning method. One in a figure is a food-utensils scrubber, and to this food-utensils scrubber 1. The positive ion stripper 2 filled up with ion-exchange resin for removing the calcium ion etc. which are contained in the water (an arrow shows) supplied from the water supply source (not shown) of a waterworks or Hitoshi Ido's exterior is formed, In the water from which calcium ion etc. were removed through said tap water, well water, etc. to this positive ion stripper 2. For example, it has the strong-alkali-water manufacturing installation 3A in which the cell 3 which adds and electrolyzes salt and generates strong alkali water (pH 10 or more) and strong acid water (pH two to about 4) is built. The strong alkali water manufactured by this cell 3 is stored in the tanks 4A and 4B in the strong-alkali-water manufacturing installation 3A, The strong alkali water in the tank 4A is heated and maintained by 50-55 ** with heating and the heat retaining device which is not illustrated, and the strong alkali water in the tank 4B is heated and maintained by 70-80 ** with heating and the heat retaining device which is not illustrated. The strong acid water manufactured by the cell 3 is similarly stored in the tank 5, and is heated and maintained by heating and the heat retaining device which is not illustrated as occasion demands. The strong acid water stored in the strong alkali water stored in the tank 4A and the tank 4B or the tank 5 opens the switching valve 6 opened and closed by the signal from the control device which is not illustrated if needed, and is sent to the lower part of the washing case 8 through the pipeline 7.

[0020]In the washing case 8 established in the tableware scrubber 1, The syringing room 9 for washing tableware etc. is formed, and in this syringing room 9. After being generated by the cell 3 and sending the strong alkali water heated and maintained to a predetermined temperature through the pipeline 7, From the pipeline 11, it is sent to the upper part by the conveying pump 10, and The injection nozzle 12a, It is injected to tableware from under the shelf-like-object 15 into which the tableware which is not illustrated from the injection nozzles 14a and 14b which it was injected to tableware from under the shelf-like-object 13 into which the tableware which is not illustrated from 12b, 12c, and 12d was put, and were provided in the upper part was put. 16 is a blowdown valve, after being opened and closed by the signal from the control device which is not illustrated and completing washing, a rinse, neutralization, etc., it can open, and sewage or rinse liquid is discharged out of the tableware scrubber 1 through the pipeline 17.

[0021]Although the cell 2 is not illustrated, the barrier membrane object of detailed porosity is established between the positive plate and cathode plate which consist of platinum plating titanium, and the voltage suitably controlled between the positive plate and the cathode plate is impressed. The tap water removed by this in the positive ion supplied in the cell 3 has salt which is not illustrated added, is electrolyzed, and strong alkali water is generated to the cathode plate side, and it generates strong acid water to the positive plate side.

[0022]Alkali detergent liquefied [18 in a figure], or powdered or proteolytic enzyme, It is a device which supplies the alkali detergent constituent etc. which added the enzyme chosen from an oil solution enzyme and amylolytic enzyme, Only a complement can add alkali detergent etc. now in the washing case 8 at a required stage from the detergent feed hopper 19 provided with the opening and closing valve opened and closed by the signal from the control device which is not illustrated. Divide the inside of the alkali detergent feed unit 18 into plurality, and a detergent feed hopper is provided for every divided division, The alkali detergent of another kind, etc. are put in each division, and each alkali detergent can be properly used suitably according to the degree of dirt, the kind of dirt, etc., or it may enable it to use it for one time or turn combining two or more alkali detergent beyond two kinds or it.

[0023]Although 20 in a figure passes a penetrant remover, a grain of cooked rice, a piece of meat, etc. eat it, and slag is a wire gauze which can be filtered. The upper surface side inner face of the washing case 8 is equipped with the single plate which has a projected rim of the lattice type which is not illustrated.

[0024]If the start button which is not illustrated is pushed in the tableware scrubber 1 of the above-mentioned composition after installing the shelf-like-objects 13 and 15 in the position in the syringing room 9, The water supplied from the water supply source of a waterworks or Hitoshi Ido's exterior according to the electrolytic condition which the positive ion was removed through the positive ion stripper 2 filled up with ion-exchange

resin, and was set up with the push button on a navigational panel. The cell 3 electrolyzes the tap water etc. which added salt to strong alkali water and strong acid water, The generated strong alkali water is sent to the tank 4A and the tank 4B, the strong alkali water in the tank 4A is heated and maintained by 50-55 ** with heating and the heat retaining device which is not illustrated, and the strong alkali water in the tank 4B is heated and maintained by 70-80 ** with heating and the heat retaining device which is not illustrated. The generated strong acid water is stored in the tank 5. And the strong alkali water first heated by 50-55 ** is supplied to the washing case 8 only optimum dose through the change-over valve 6 and the pipeline 7.

[0025]If the strong alkali water heated by optimum dose of 50-55 ** is supplied to the washing case 8, Initial complements, such as a kind suitable in the washing case 8 of alkali detergent, are added from the detergent feed hopper 19, and strong alkali water is dissolved and mixed, Heat further with the heater which the washing case 8 will not illustrate if heating is insufficient, and it is maintained by 50-55 **, By the positive rotation of the conveying pump 10, from the pipeline 11, it is sent to the upper part and The injection nozzle 12a, It is injected to tableware from under the shelf-like-object 15 into which the tableware which is not illustrated from the injection nozzles 14a and 14b which it was injected to tableware from under the shelf-like-object 13 into which the tableware which is not illustrated from 12b, 12c, and 12d was put, and were provided in the upper part was put. While the strong alkali water (a penetrant remover is called) heated by 50-55 ** containing the alkali detergent etc. which blew off hits tableware and dirt is washed out, the penetrant remover which dispersed even on the ceiling of the syringing room 9 is transmitted in the projected rim provided in this ceiling surface, falls right under right under [abbreviated], and washes out the dirt of tableware also from the upper surface side. A penetrant remover is circulated with the conveying pump 10, and washing is fully performed. It eats through the wire gauze 20, and slag is filtered, it eats, slag is collected on the wire gauze 20, only a penetrant remover circulates through the sewage which fell at the pars basilaris ossis occipitalis of the washing case 8, and washing of tableware is performed fixed time. Next, while washing by changing the change-over valve 6, carrying out the specified quantity feed water of the strong acid water in the tank 5 from the pipeline 7 to the tableware scrubber 1, carrying out positive rotation of the conveying pump 10, and rinsing it, food utensils are sterilized and wastewater is neutralized. And the blowdown valve 16 is opened, the conveying pump 10 is rotated reversely, and the pipeline 11 and the sewage of the lower part of the washing case 8 are discharged.

[0026]Next, only optimum dose supplies the strong alkali water heated by 70-80 ** to the washing case 8 through the change-over valve 6 and the pipeline 7. If the strong alkali water heated by optimum dose of 70-80 ** is supplied to the washing case 8, Initial complements, such as a kind suitable in the washing case 8 of alkali detergent, are added from the detergent feed hopper 19, and strong alkali water is dissolved and mixed, Heat further with the heater which the washing case 8 will not illustrate if heating is insufficient, and it is maintained by 70-80 **, By the positive rotation of the conveying pump 10, from the pipeline 11, it is sent to the upper part and The injection nozzle 12a, It is injected to tableware from under the shelf-like-object 15 into which the tableware which is not illustrated from the injection nozzles 14a and 14b which it was injected to tableware from under the shelf-like-object 13 into which the tableware which is not illustrated from 12b, 12c, and 12d was put, and were provided in the upper part was put. The strong alkali water (a penetrant remover is called) heated by 70-80 ** containing the alkali detergent etc. which blew off hits tableware, and dirt is washed out like the above-mentioned case. A penetrant remover is circulated with the conveying pump 10, washing is fully performed, and washing of tableware is performed fixed time.

[0027]Next, while washing by changing the change-over valve 6, carrying out the specified quantity feed water of the strong acid water in the tank 5 from the pipeline 7 to the tableware scrubber 1, carrying out positive rotation of the conveying pump 10, and rinsing it, food utensils are sterilized and wastewater is neutralized. And the blowdown valve 16 is opened, the conveying pump 10 is rotated reversely, and the pipeline 11 and the sewage of the lower part of the washing case 8 are discharged. With wastewater, the feed water valve which is not illustrated is opened, and temperature control of the rinse liquid, such as tap water, is carried out, or water is supplied in a syringing room at ordinary temperature, and after washing by carrying out positive rotation of the conveying pump 10, and rinsing it, sewage is drained similarly.

[0028]If food utensils which contain ingredients, such as protein, an oil, and starch, as mentioned above, such as the plate to which it ate and slag adhered, a bowl, a teacup, SAJI, a spoon, and chopsticks, are washed, by washing with a low-temperature penetrant remover first, the pretreatment effect and immersion of as opposed to [while being able to drop protein dirt and oil contamination] dirt, such as a grain of cooked rice and a lip stick, in washing with the penetrant remover of this low temperature -- by washing succeedingly with the penetrant remover of an elevated temperature effective, The problem of proteinic coagulation can be avoided and dirt, such as a grain of cooked rice and a lip stick, can fully be removed. Washing with this hot penetrant remover has a bactericidal effect. Since strong acid water has fungistatic action, while tableware etc. are kept cleaner, it is controlled that eat to the tableware scrubber itself and an offensive odor occurs by slag. Since food utensils can be efficiently washed only by adding 0.2 or less % of the weight of alkali detergent even if food utensils are fairly dirty, the detergent concentration contained in wastewater decreases. Since wash water after washing food utensils is neutralized and drained using strong acid water, the adverse effect to environment can be reduced.

[0029]

[Example]Next, this invention is not limited by these although an example explains this invention in more detail.

(Experiment)

(1) Since there were starch dirt, protein dirt, and oil contamination when the dirt adhering to the kind food utensils of dirt was divided roughly, the egg was selected as a grain of cooked rice and protein dirt as starch dirt, and vegetable oil and a lip stick were selected as oil contamination. Since the egg was said for coagulation temperature to differ from a white and the yolk, it was separately used as a sample.

(2) The adjustment method of dirt and adhesion method ** starch dirt made cooking-rice rice adhere to slide glass in pressure 0.5 kg/cm² with a rheometer, were neglected to the room temperature for 1 hour, and were made into the sample. The survivability after washing was checked at the iodine starch reaction.

** Protein dirt made the yolk and the white of the egg adhere to slide glass independently, was neglected to the room temperature for 1 hour, and was made into the sample. Since a white was transparent, protein indicator amido black 10B was added, it colored, and it became dirty, and checked the grade of omission. The survivability of the yolk after washing was checked by an amide SHUBARUTSU reaction.

** The oil after stir-frying beef was used for oil contamination. That is, oily indicator Oilred O was added to what is mixing an oil, bouillon, and a small amount of protein, and what was neglected to the room temperature for 1 hour was made into the sample after adhering to slide glass.

** The lipstick made from REPIASU <6> (main ingredients: dibutylhydroxytoluene) was used for the lip stick, it was made to adhere to slide glass, and made the sample what was neglected to the room temperature for 1 hour.

[0030](3). [whether the strong alkali water (pH 12.1-12.3) made using the strong-alkali-water manufacture machine [business-use acid water generation machine FSW-S150 SANYO Electric Co., Ltd. make] is used for a use penetrant remover penetrant remover, and] Or that in which only the specified quantity added the alkali detergent for dishwashers (trade name: the wash mate S, the product made from an ADEKA, Inc. clean aid) was used.

** The temperature of the penetrant remover was 40, 45, 50, 55, 60, 65, 70, and 75 or 80

**. In the grain of cooked rice and the lip stick, at 60 **, since there was no cleaning effect, it examined at 63-80 **.

[0031]Cleaning method detergent concentration : (4) 0%, 0.05%, 0.1%, 0.15%, Temperature of a 0.2% penetrant remover: Since an egg has a possibility of solidifying if it exceeds 55 **, an egg and an oil shall be 50 ** and 55 ** since an oil becomes difficult to fall at less than 50 **, a grain of cooked rice became difficult to fall at less than 70 ** and a lip stick became difficult to fall at less than 63 **, the grain of cooked rice and the lip stick were 75 **. Six slide glasses stained with dirt were put in the penetrant remover in a monograph affair, and stirring washing was carried out for 5 minutes.

(5) Viewing and a photograph estimated the quantity of the dirt adhering to the slide glass after valuation method washing.

(6) The result of an experimental result experiment is shown in Table 1. However, O: cleaning effect (size), O:cleaning effect (inside), **: A cleaning effect (smallness) is shown. Although the part which attached () was able to take dirt after washing, it is shown that the portion to which dirt had adhered before washing crawled water.

[0032]

[Table 1]

汚れの種類		ご飯粒	口紅	卵白身	卵白身	卵黄身	卵黄身	油	油
洗浄温度 (℃)		75	75	50	55	50	55	50	55
洗剤濃度 (w t %)	0.2	◎	◎	◎	◎	◎	◎	◎	◎
	0.15	◎	◎	◎	◎	◎	◎	◎	◎
	0.1	○	◎	◎	◎	◎	◎	◎	◎
	0.05	○	(○)	◎	◎	(○)	(○)	(○)	(○)
	0	○	△	◎	◎	(○)	(○)	(○)	(○)

[0033]It has checked that a grain of cooked rice had a cleaning effect with the washing temperature of 75 ** by 0.15 % of the weight or more of detergent concentration, and a lip stick had a cleaning effect with the washing temperature of 75 ** from Table 1 by 0.1 % of the weight or more of detergent concentration. The white of the egg has checked the cleaning effect by all the above-mentioned cleaning conditions. Water was crawled in the part to which dirt had adhered after washing in the case where a detergent is not added although the yolk and the oil of the egg have checked the cleaning effect by all the above-mentioned cleaning conditions, and 0.05 % of the weight of detergent concentration although dirt came off. Therefore, in order to remove all the dirt, it turns out that it is desirable to lower the protein solidified at the time of elevated-temperature washing to the first step, and to drop the lip stick which raises the temperature of a penetrant remover on a second stage story, and could not fall easily conventionally, and a grain of cooked rice. Namely, if it washes using the 50-55 ** penetrant remover of about 0 to 0.1 % of the weight of detergent concentration first, while being able to wash without solidifying protein, It turns out that oil contamination can also be washed, and starch, such as a grain of cooked rice, can be washed by washing succeedingly using the 70-80 ** penetrant remover of about 0.1 to 0.15 % of the weight of detergent concentration, and a lip stick can also be washed.

[0034]

[Effect of the Invention]This invention can wash efficiently food utensils containing ingredients, such as protein, an oil, and starch, such as the plate to which it ate and slag adhered, a bowl, a teacup, SAJI, a spoon, and chopsticks, by use of a little detergents. That is, oil contamination can also be washed while being able to wash without solidifying the protein which has adhered to food utensils by washing using the penetrant remover which added alkali detergent to the strong alkali water first heated by about 50-55 ** low temperature in food utensils if needed. And by washing alkali detergent succeedingly using the penetrant remover added about 0.1 to 0.15% of the weight to the strong alkali water heated by the about 70-80 ** elevated temperature, There is a cleaning effect also to the lip stick which can wash starch, such as a boiled rice grain it was presupposed that were hard to fall until now, and has been the present problem with the food-utensils scrubber. Washing in an elevated temperature of about 70-80 ** has a bactericidal effect. If the strong alkali water heated by about 50-55 ** and the strong alkali water heated by about 70-80 ** are stored in the respectively different tank, temperature can be saved in prescribed temperature and washing time can be shortened.

[0035]Since the ingredient disintegration (a proteolysis operation, an oil solution operation, an amylolysis operation, etc.) of various enzymes will be added if the enzyme chosen as alkali detergent from a proteolytic enzyme, an oil solution enzyme, amylolytic enzyme, etc. is added, a cleaning effect rises dramatically. Since the food utensils containing ingredients, such as protein, an oil, and starch, to which it ate and slag

adhered can be efficiently washed only by adding 0.2 or less % of the weight of alkali detergent even if food utensils are fairly dirty, the detergent concentration contained in wastewater decreases. If wash water after washing food utensils is neutralized and drained using strong acid water, the adverse effect to natural environment can be reduced. Since the food-utensils scrubber of this invention and the cleaning method of food utensils consist of easy composition, since the effect is large, their industrial utility value is high [it is economical, and also].

[Translation done.]